In [2]:

```python
import pandas as pd
from sklearn import preprocessing
df=pd.read_csv("/home/student/Desktop/COTC50/Iris.csv")
df
```

Out[2]:

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	1	5.1	3.5	1.4	0.2	Iris-setosa
1	2	4.9	3.0	1.4	0.2	Iris-setosa
2	3	4.7	3.2	1.3	0.2	Iris-setosa
3	4	4.6	3.1	1.5	0.2	Iris-setosa
4	5	5.0	3.6	1.4	0.2	Iris-setosa
...	...	...	...	...	...	...
145	146	6.7	3.0	5.2	2.3	Iris-virginica
146	147	6.3	2.5	5.0	1.9	Iris-virginica
147	148	6.5	3.0	5.2	2.0	Iris-virginica
148	149	6.2	3.4	5.4	2.3	Iris-virginica
149	150	5.9	3.0	5.1	1.8	Iris-virginica

150 rows × 6 columns

In [2]:

```python
df.mean()
```

```
/tmp/ipykernel_5352/3698961737.py:1: FutureWarning: The default value o
f numeric_only in DataFrame.mean is deprecated. In a future version, it
will default to False. In addition, specifying 'numeric_only=None' is d
eprecated. Select only valid columns or specify the value of numeric_on
ly to silence this warning.
  df.mean()
```

Out[2]:

```
Id                 75.500000
SepalLengthCm       5.843333
SepalWidthCm        3.054000
PetalLengthCm       3.758667
PetalWidthCm        1.198667
dtype: float64
```

In [3]:

```python
df.loc[:,"SepalLengthCm"].mean()
```

Out[3]:

```
5.843333333333334
```

In [6]:

```python
df.mean(axis=1)[0:4]
```

```
/tmp/ipykernel_5352/1148177455.py:1: FutureWarning: Dropping of nuisanc
e columns in DataFrame reductions (with 'numeric_only=None') is depreca
ted; in a future version this will raise TypeError.  Select only valid
columns before calling the reduction.
  df.mean(axis=1)[0:4]
```

Out[6]:

```
0    2.24
1    2.30
2    2.48
3    2.68
dtype: float64
```

In [7]:

```
df.median()
```

```
/tmp/ipykernel_5352/530051474.py:1: FutureWarning: The default value of
numeric_only in DataFrame.median is deprecated. In a future version, it
will default to False. In addition, specifying 'numeric_only=None' is d
eprecated. Select only valid columns or specify the value of numeric_on
ly to silence this warning.
  df.median()
```

Out[7]:

```
Id                75.50
SepalLengthCm      5.80
SepalWidthCm       3.00
PetalLengthCm      4.35
PetalWidthCm       1.30
dtype: float64
```

In [8]:

```
df.loc[:,"SepalLengthCm"].median()
```

Out[8]:

```
5.8
```

In [9]:

```
df.median(axis=1)[0:4]
```

```
/tmp/ipykernel_5352/381455229.py:1: FutureWarning: Dropping of nuisance
columns in DataFrame reductions (with 'numeric_only=None') is deprecate
d; in a future version this will raise TypeError.  Select only valid co
lumns before calling the reduction.
  df.median(axis=1)[0:4]
```

Out[9]:

```
0    1.4
1    2.0
2    3.0
3    3.1
dtype: float64
```

In [10…

```
df.mode()
```

Out[10]:

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	1	5.0	3.0	1.5	0.2	Iris-setosa
1	2	NaN	NaN	NaN	NaN	Iris-versicolor
2	3	NaN	NaN	NaN	NaN	Iris-virginica
3	4	NaN	NaN	NaN	NaN	NaN
4	5	NaN	NaN	NaN	NaN	NaN
...	...	...	...	...	...	...
145	146	NaN	NaN	NaN	NaN	NaN
146	147	NaN	NaN	NaN	NaN	NaN
147	148	NaN	NaN	NaN	NaN	NaN
148	149	NaN	NaN	NaN	NaN	NaN
149	150	NaN	NaN	NaN	NaN	NaN

150 rows × 6 columns

In [11…

```
df.loc[:,"SepalLengthCm"].mode()
```

Out[11]:

```
0    5.0
Name: SepalLengthCm, dtype: float64
```

In [4]:

```
df.mode(axis=1)[0:4]
```

```
/tmp/ipykernel_17236/657814072.py:1: UserWarning: Unable to sort modes:
'<' not supported between instances of 'str' and 'float'
  df.mode(axis=1)[0:4]
/tmp/ipykernel_17236/657814072.py:1: UserWarning: Unable to sort modes:
'<' not supported between instances of 'str' and 'float'
  df.mode(axis=1)[0:4]
/tmp/ipykernel_17236/657814072.py:1: UserWarning: Unable to sort modes:
'<' not supported between instances of 'str' and 'float'
  df.mode(axis=1)[0:4]
/tmp/ipykernel_17236/657814072.py:1: UserWarning: Unable to sort modes:
'<' not supported between instances of 'str' and 'float'
  df.mode(axis=1)[0:4]
/tmp/ipykernel_17236/657814072.py:1: UserWarning: Unable to sort modes:
'<' not supported between instances of 'str' and 'int'
  df.mode(axis=1)[0:4]
/tmp/ipykernel_17236/657814072.py:1: UserWarning: Unable to sort modes:
'<' not supported between instances of 'str' and 'int'
  df.mode(axis=1)[0:4]
/tmp/ipykernel_17236/657814072.py:1: UserWarning: Unable to sort modes:
'<' not supported between instances of 'str' and 'int'
  df.mode(axis=1)[0:4]
/tmp/ipykernel_17236/657814072.py:1: UserWarning: Unable to sort modes:
'<' not supported between instances of 'str' and 'int'
  df.mode(axis=1)[0:4]
/tmp/ipykernel_17236/657814072.py:1: UserWarning: Unable to sort modes:
'<' not supported between instances of 'str' and 'int'
  df.mode(axis=1)[0:4]
/tmp/ipykernel_17236/657814072.py:1: UserWarning: Unable to sort modes:
'<' not supported between instances of 'str' and 'int'
  df.mode(axis=1)[0:4]
/tmp/ipykernel_17236/657814072.py:1: UserWarning: Unable to sort modes:
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  df.mode(axis=1)[0:4]
/tmp/ipykernel_17236/657814072.py:1: UserWarning: Unable to sort modes:
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  df.mode(axis=1)[0:4]
/tmp/ipykernel_17236/657814072.py:1: UserWarning: Unable to sort modes:
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  df.mode(axis=1)[0:4]
/tmp/ipykernel_17236/657814072.py:1: UserWarning: Unable to sort modes:
'<' not supported between instances of 'str' and 'int'
  df.mode(axis=1)[0:4]
/tmp/ipykernel_17236/657814072.py:1: UserWarning: Unable to sort modes:
'<' not supported between instances of 'str' and 'int'
  df.mode(axis=1)[0:4]
/tmp/ipykernel_17236/657814072.py:1: UserWarning: Unable to sort modes:
'<' not supported between instances of 'str' and 'int'
  df.mode(axis=1)[0:4]
/tmp/ipykernel_17236/657814072.py:1: UserWarning: Unable to sort modes:
'<' not supported between instances of 'str' and 'int'
  df.mode(axis=1)[0:4]
/tmp/ipykernel_17236/657814072.py:1: UserWarning: Unable to sort modes:
'<' not supported between instances of 'str' and 'int'
  df.mode(axis=1)[0:4]
/tmp/ipykernel_17236/657814072.py:1: UserWarning: Unable to sort modes:
```

```
'<' not supported between instances of 'str' and 'int'
  df.mode(axis=1)[0:4]
/tmp/ipykernel_17236/657814072.py:1: UserWarning: Unable to sort modes:
'<' not supported between instances of 'str' and 'int'
  df.mode(axis=1)[0:4]
/tmp/ipykernel_17236/657814072.py:1: UserWarning: Unable to sort modes:
'<' not supported between instances of 'str' and 'int'
  df.mode(axis=1)[0:4]
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'<' not supported between instances of 'str' and 'int'
  df.mode(axis=1)[0:4]
/tmp/ipykernel_17236/657814072.py:1: UserWarning: Unable to sort modes:
'<' not supported between instances of 'str' and 'int'
  df.mode(axis=1)[0:4]
/tmp/ipykernel_17236/657814072.py:1: UserWarning: Unable to sort modes:
'<' not supported between instances of 'str' and 'int'
  df.mode(axis=1)[0:4]
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'<' not supported between instances of 'str' and 'int'
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'<' not supported between instances of 'str' and 'int'
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```

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'<' not supported between instances of 'str' and 'int'
  df.mode(axis=1)[0:4]
```

Out[4]:

	0	1	2	3	4	5
0	1	5.1	3.5	1.4	0.2	Iris-setosa
1	2	4.9	3.0	1.4	0.2	Iris-setosa
2	3	4.7	3.2	1.3	0.2	Iris-setosa
3	4	4.6	3.1	1.5	0.2	Iris-setosa

In [15…

```
df.min()
```

Out[15]:

```
Id                          1
SepalLengthCm             4.3
SepalWidthCm              2.0
PetalLengthCm             1.0
PetalWidthCm              0.1
Species           Iris-setosa
dtype: object
```

In [16…

```
df.loc[:,"SepalLengthCm"].min(skipna = False)
```

Out[16]:

```
4.3
```

In [17…

```
df.max()
```

Out[17]:

```
Id                             150
SepalLengthCm                  7.9
SepalWidthCm                   4.4
PetalLengthCm                  6.9
PetalWidthCm                   2.5
Species           Iris-virginica
dtype: object
```

In [18…

```
df.loc[:,"SepalLengthCm"].max(skipna = False)
```

Out[18]:

```
7.9
```

In [19…

```
df.std()
```

```
/tmp/ipykernel_5352/3390915376.py:1: FutureWarning: The default value o
f numeric_only in DataFrame.std is deprecated. In a future version, it
will default to False. In addition, specifying 'numeric_only=None' is d
eprecated. Select only valid columns or specify the value of numeric_on
ly to silence this warning.
  df.std()
```

Out[19]:

```
Id               43.445368
SepalLengthCm     0.828066
```

```
SepalWidthCm      0.433594
PetalLengthCm     1.764420
PetalWidthCm      0.763161
dtype: float64
```

In [21…

```
df.loc[:,'SepalLengthCm'].std()
```

Out[21]:

```
0.8280661279778629
```

In [22…

```
df.std(axis=1)[0:4]
```

```
/tmp/ipykernel_5352/3966588610.py:1: FutureWarning: Dropping of nuisanc
e columns in DataFrame reductions (with 'numeric_only=None') is depreca
ted; in a future version this will raise TypeError.  Select only valid
columns before calling the reduction.
  df.std(axis=1)[0:4]
```

Out[22]:

```
0    2.010721
1    1.772005
2    1.754138
3    1.813009
dtype: float64
```

In [23…

```
df.groupby(['Id'])['SepalLengthCm'].mean()
```

Out[23]:

```
Id
1      5.1
2      4.9
3      4.7
4      4.6
5      5.0
      ...
146    6.7
147    6.3
148    6.5
149    6.2
150    5.9
Name: SepalLengthCm, Length: 150, dtype: float64
```

In [29…

```
df_u=df.rename(columns= {'SepalLengthCm$)':'SepalLen'},inplace=False)
```

In [32…

```
enc = preprocessing.OneHotEncoder()
enc_df = pd.DataFrame(enc.fit_transform(df[['Species']]).toarray())
enc_df
```

Out[32]:

	0	1	2
0	1.0	0.0	0.0
1	1.0	0.0	0.0
2	1.0	0.0	0.0
3	1.0	0.0	0.0
4	1.0	0.0	0.0
...	...	...	...
145	0.0	0.0	1.0
146	0.0	0.0	1.0
147	0.0	0.0	1.0
148	0.0	0.0	1.0

	0	1	2
149	0.0	0.0	1.0

150 rows × 3 columns

In [33…

```
df_encode=df_u.join(enc_df)
df_encode
```

Out[33]:

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species	0	1
0	1	5.1	3.5	1.4	0.2	Iris-setosa	1.0	0.0
1	2	4.9	3.0	1.4	0.2	Iris-setosa	1.0	0.0
2	3	4.7	3.2	1.3	0.2	Iris-setosa	1.0	0.0
3	4	4.6	3.1	1.5	0.2	Iris-setosa	1.0	0.0
4	5	5.0	3.6	1.4	0.2	Iris-setosa	1.0	0.0
...	...	...	...	...	...	...	...	...
145	146	6.7	3.0	5.2	2.3	Iris-virginica	0.0	0.0
146	147	6.3	2.5	5.0	1.9	Iris-virginica	0.0	0.0
147	148	6.5	3.0	5.2	2.0	Iris-virginica	0.0	0.0
148	149	6.2	3.4	5.4	2.3	Iris-virginica	0.0	0.0
149	150	5.9	3.0	5.1	1.8	Iris-virginica	0.0	0.0

150 rows × 9 columns

In [35…

```
col_names =['SepalLengthCm','SepalWidthCm','PetalLengthCm','PetalWidthC
```

In [43…

```
iris = pd.read_csv("/home/student/Desktop/COTC50/Iris.csv")
```

In [44…

```
irisSet = (iris['Species']== 'Iris-setosa')
```

In [47…

```
iris[irisSet]=="Iris-setosa"
print('Iris-setosa')
print(iris[irisSet].describe())
```

```
Iris-setosa
             Id  SepalLengthCm  SepalWidthCm  PetalLengthCm  PetalWidth
Cm
count  50.00000       50.00000     50.000000      50.000000      50.000
00
mean   25.50000        5.00600      3.418000       1.464000       0.244
00
```

```
std    14.57738        0.35249      0.381024       0.173511       0.107
21
min     1.00000        4.30000      2.300000       1.000000       0.100
00
25%    13.25000        4.80000      3.125000       1.400000       0.200
00
50%    25.50000        5.00000      3.400000       1.500000       0.200
00
75%    37.75000        5.20000      3.675000       1.575000       0.300
00
max    50.00000        5.80000      4.400000       1.900000       0.600
00
```

In [54…

```
irisVer = (iris['Species']== 'Iris-versicolor')
print('Iris-versicolor')
print(iris[irisVer].describe())
```

```
Iris-versicolor
              Id  SepalLengthCm  SepalWidthCm  PetalLengthCm  PetalWidt
hCm
count   50.00000      50.000000     50.000000      50.000000     50.000
000
mean    75.50000       5.936000      2.770000       4.260000      1.326
000
std     14.57738       0.516171      0.313798       0.469911      0.197
753
min     51.00000       4.900000      2.000000       3.000000      1.000
000
25%     63.25000       5.600000      2.525000       4.000000      1.200
000
50%     75.50000       5.900000      2.800000       4.350000      1.300
000
75%     87.75000       6.300000      3.000000       4.600000      1.500
000
max    100.00000       7.000000      3.400000       5.100000      1.800
000
```

In [56…

```
irisVir = (iris['Species']== 'Iris-virginica')
print('Iris-virginica')
print(iris[irisVir].describe())
```

```
Iris-virginica
              Id  SepalLengthCm  SepalWidthCm  PetalLengthCm  PetalWidt
hCm
count   50.00000       50.00000     50.000000      50.000000      50.00
000
mean   125.50000        6.58800      2.974000       5.552000       2.02
600
std     14.57738        0.63588      0.322497       0.551895       0.27
465
min    101.00000        4.90000      2.200000       4.500000       1.40
000
25%    113.25000        6.22500      2.800000       5.100000       1.80
000
50%    125.50000        6.50000      3.000000       5.550000       2.00
000
75%    137.75000        6.90000      3.175000       5.875000       2.30
000
max    150.00000        7.90000      3.800000       6.900000       2.50
000
```

In [ ]: